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10/590,659	11/08/2006	Shigetoshi Sugawa	039262-0159	2132

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EXAMINER

ARMAND, MARC ANTHONY

ART UNIT	PAPER NUMBER
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2814

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/590,659	Applicant(s) SUGAWA, SHIGETOSHI	
	Examiner MARC ARMAND	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5,31 and 32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,31 and 32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>08/25/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In claim 1, the “control signal generator” was not described in specification.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. It is not clear or described in the specification “the control signal generator”. For purpose of examination, the examiner will read the claim as the following: a control signal generator that supplies a transfer control signal to a transfer signal line.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 31, 32 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Rhodes et al., (Rhodes) US 2004/0251394.

Regarding claim 31, Rhodes shows in fig.1A a solid-state imaging device having an integrated array of a plurality of pixels, each pixel comprising: a photodiode (12)(para 0028) for receiving light and generating photoelectric charges; a transfer transistor (14)(para 0028) for transferring the photoelectric charges; and a storage capacitor (32)(para 0028) element coupled to the photodiode (12) at least through the transfer transistor (14) for accumulating, at least through the transfer transistor, the photoelectric charges overflowing from the photodiode during accumulating operation.

As for the statements “for accumulating, at least through the transfer transistor, the photoelectric charges overflowing from the photodiode during accumulating operation and wherein the storage capacitor accumulates the photoelectric charges overflowing from said photodiode during said accumulating operation.” is considered functional limitations. Labels, statements of intended use, or functional language do not structurally distinguish claims over prior art. The structure of the device is substantially identical to that of the claimed structure which can function in the same manner, be labeled in the same manner, or be used in the same manner. *MPEP 2112.01.*

Regarding claim 32, Rhodes shows in fig.1A a solid-state imaging device having an integrated array of a plurality of pixels, each pixel comprising: a photodiode (12)(para 0028) for receiving light and generating photoelectric charges; a transfer transistor (14)(para 0028) for transferring the photoelectric charges; a floating region (22) operatively coupled to said photodiode through said transfer transistor (14); said transfer transistor being adapted to pass there through the photoelectric charges overflowing from the photodiode during accumulating operation; wherein said storage capacitor (32) accumulates the photoelectric charges overflowing from said photodiode (12) during said accumulating operation, and said floating region (22) is split from said storage capacitor (32) to accumulate the photoelectric charges from said photodiode (12) and coupled to said storage capacitor to mix the photoelectric charges accumulated therein with the overflowed photoelectric charges accumulated in said storage capacitor (32).a storage transistor (30) coupled to said floating region (22), a storage capacitor element (32) operatively coupled to said floating region (22) through said storage transistor (30); said storage transistor (30) being adapted to couple or split potentials of said floating region and said storage capacitor.

As for the statements “being adapted to pass there through the photoelectric charges overflowing from the photodiode during accumulating operation, to accumulate the photoelectric charges from said photodiode” is considered functional limitations. Labels, statements of intended use, or functional language do not structurally distinguish claims over prior art. The structure of the device is substantially identical to

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that of the claimed structure which can function in the same manner, be labeled in the same manner, or be used in the same manner. *MPEP 2112.01*.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 1-3 (as far as understood) are rejected under 35 U.S.C. 103(a) as being unpatentable over Rhodes at al., (Rhodes) US 2004/0251394 in view of Suzuki US 2003/0206235.

Regarding claim 1, Rhodes shows in fig.1A a solid-state imaging device having an integrated array of a plurality of pixels, each pixel comprising: a photodiode (12)(para 0028) for receiving light and generating photoelectric charges; a transfer transistor (14)(para 0028) for transferring the photoelectric charges; and a storage capacitor (32)(para 0028) element coupled to the photodiode (12) at least through the transfer transistor (14); the storage capacitor (32) accumulates the photoelectric charges overflowing from the photodiode during the accumulation operation.

Rhodes differs from the claimed invention because he does not explicitly disclose a semiconductor device having a control signal generator.

Suzuki discloses (para 0227) an image sensor having a control signal generator that supplies a transfer control signal to a transfer signal line.

Suzuki is evidence that ordinary workers skilled in the art would find reasons, suggestions or motivations to modify the device of Rhodes. Therefore, at the time the invention was made; it would have been obvious to have a semiconductor device having a control signal generator because it will provide an improve device with back light correction and eliminate blur (para 0027, 0028).

AS for the statements “accumulates the photoelectric charges overflowing from the photodiode during the accumulation operation” is considered functional limitations. Labels, statements of intended use, or functional language do not structurally

distinguish claims over prior art. The structure of the device is substantially identical to that of the claimed structure which can function in the same manner, be labeled in the same manner, or be used in the same manner. *MPEP 2112.01*.

Regarding claim 2, Rhodes shows in fig. 1A a solid-state imaging device comprising between the transfer transistor (14) and the storage capacitor element (32): a floating region (22) (para 0028) to which the photoelectric charges are transferred via the transfer transistor; and a storage transistor (30) (para 0028) operative for coupling or splitting potentials of the floating region and the storage capacitor element.

As for the statements “operative to couple or split potentials of the floating region and the storage capacitor element”; they are considered functional limitations. Labels, statements of intended use, or functional language do not structurally distinguish claims over prior art. The structure of the device is substantially identical to that of the claimed structure which can function in the same manner, be labeled in the same manner, or be used in the same manner. *MPEP 2112.01*.

Regarding claim 3, Rhodes shows in fig. 1A an imaging device having a reset transistor (16) coupled to the floating region (22) for discharging the photoelectric charges of the floating region; an amplifier transistor (18) for amplifying the photoelectric charges in the floating region for conversion to a voltage signal; and a selection transistor (20) coupled to the amplifier transistor for selecting the pixel.

As for the statements “for amplifying the photoelectric charges in the floating region for conversion to a voltage signal”; they are considered functional limitations.

Labels, statements of intended use, or functional language do not structurally distinguish claims over prior art. The structure of the device is substantially identical to that of the claimed structure which can function in the same manner, be labeled in the same manner, or be used in the same manner. *MPEP 2112.01*.

12. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rhodes in view of Nakamura; (Nakamura) US2002/0021121.

Regarding claims 4 and 5, Rhodes discloses in fig.1A an imager.

Rhodes differs from the claimed invention because he does not explicitly disclose an imager device having a logarithmic conversion circuit for executing logarithmic conversion for executing logarithmic conversion of the photoelectric charges accumulated in the storage capacitor element for readout and overflowing from the photodiode for accumulation in the storage capacitor element

Nakamura discloses (para 0133) an imager device having a logarithmic conversion circuit for executing logarithmic conversion of charges.

Nakamura is evidence that ordinary workers skilled in the art would find reasons, suggestions or motivations to modify the device of Rhodes. Therefore, At the time the invention was made; it would have been obvious to have an imager device having a logarithmic conversion circuit for executing logarithmic conversion of charges; teaching of Nakamura in it's device because it will provide a device that output electric signal proportional to the intensity of the light (para 0052) and will also improve the light condition (para 0004).

As for the statements “for executing logarithmic conversion of the photoelectric charges accumulated in the storage capacitor element for readout; for executing logarithmic conversion of the photoelectric charges accumulated in the storage capacitor element for readout; it is considered functional limitations. Labels, statements of intended use, or functional language do not structurally distinguish claims over prior art. The structure of the device is substantially identical to that of the claimed structure which can function in the same manner, be labeled in the same manner, or be used in the same manner. *MPEP 2112.01*.

13. Claim 1, (as far as understood) is rejected under 35 U.S.C. 103(a) as being unpatentable over Merrill; (Merril) US 2002/0036700 in view of Suzuki US 2003/0206235.

Regarding claim 1, Merrill shows in fig.7 a solid-state imaging device having an integrated array of a plurality of pixels, each pixel comprising: a photodiode (202)(para 0043) for receiving light and generating photoelectric charges; a transfer transistor (212)(para 0044) for transferring the photoelectric charges; and a storage capacitor (216) (para 0044) element coupled to the photodiode (202) at least through the transfer transistor (212) for accumulating, at least through the transfer transistor, the photoelectric charges overflowing from the photodiode during accumulating operation.

Merril differs from the claimed invention because he does not explicitly disclose a semiconductor device having a control signal generator.

Suzuki discloses (para 0227) an image sensor having a control signal generator that supplies a transfer control signal to a transfer signal line.

Suzuki is evidence that ordinary workers skilled in the art would find reasons, suggestions or motivations to modify the device of Merrill. Therefore, at the time the invention was made; it would have been obvious to have a semiconductor device having a control signal generator because it will provide an improve device with back light correction and eliminate blur (para 0027, 0028).

AS for the statements "accumulates the photoelectric charges overflowing from the photodiode during the accumulation operation" is considered functional limitations. Labels, statements of intended use, or functional language do not structurally distinguish claims over prior art. The structure of the device is substantially identical to that of the claimed structure which can function in the same manner, be labeled in the same manner, or be used in the same manner. *MPEP 2112.01*.

Response to Arguments

14. Applicant's arguments with respect to claims 1-5, 31, and 32 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARC ARMAND whose telephone number is (571)272-9751. The examiner can normally be reached on 9-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MARC ARMAND/
Examiner, Art Unit 2814

/Wai-Sing Louie/
Primary Examiner, Art Unit 2814

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